

REMARKS

Claims 1 and 86-107 are pending. Claims 1, 87, 88, 90, 94, and 101 have been amended. Claims 91, 100, 102-103, and 107 have been canceled. New claim 108 has been added. Accordingly, claims 1, 86-90, 92-99, 101, and 104-108 will be pending upon entry of the response.

Applicant respectfully submits that no new matter has been added in the amendments to claims 1, 87, 88, 90, 94, and 101, or in new claim 108. Support for these amendments may be found throughout the specification and claims as originally filed. Specifically, support for the amendment to claim 1 may be found in previously pending claims 87, 90 and 103, the limitations of which have been incorporated into amended claim 1. Additionally, support for the modified amino acid sequence having 80% or greater sequence identity with the binding domain of the β integrin subunit may be found at least at page 13, lines 14-19 of the specification, as well as at page 18, line 13 to page 19, line 3, which provides a consensus scheme for the binding domains of the β 2, β 3, β 5 and β 6 for ERK2. On this point, the Examiner will also note, for example, that the β 5 and β 6 derived amino acid sequences RSRARNPLYR (SEQ ID No. 9) and RSKAKNPLYR (SEQ ID No. 7) have 80% sequence identity with each other, as do the β 3 derived sequence RARAKNPLYK (SEQ ID No. 8) with RSRARNPLYR (SEQ ID No. 9). Support for new claim 108 may be found in claim 93, as well as at least at page 19, line 4 to page 20, line 6 of the specification.

Elections/Restrictions

The Applicant further reiterates the submissions made in rebuttal to the Restriction Requirement(s) previously raised by the Examiner. In particular, it is noted that the claims as amended are all characterized by the same inventive concept, namely the use of a polypeptide providing a binding domain of a β integrin subunit for the MAP kinase ERK2 (or a modified form of the polypeptide) for the prophylaxis or treatment of cancer wherein the β integrin subunit is not expressed by the cancer cells. Although claim 1 allows for the β integrin subunit to be selected from the group consisting of β 2, β 3, β 5 and β 6, β 2, β 3, β 5 and β 6 are all members of the same class of integrin subunits with a binding domain for ERK2 that has an intervening linker region joining opposite end regions of the binding domain together that is non-essential for the binding if ERK2 (and so can be deleted). Hence, the claims as amended are simply drawn to aspects of the same invention and permit a sufficient search and examination in the one application to be conducted

without any serious burden on the Examiner. Furthermore, Applicant respectfully notes that PCT Rule 13.4 states,

“Subject to Rule 13.1, it shall be permitted to include in the same international application a reasonable number of dependent claims, claiming specific forms of the invention claimed in an independent claim, even where the features of any dependent claim could be considered as constituting in themselves an invention.”

It is Applicant's position that the claims, as amended, are clearly unified. However, even if the Examiner believes that subject matter contained within the dependent claims were to represent patentably distinct inventions, it is Applicant's position that such disclosure represents a reasonable number of dependent claims as defined by PCT Rule 13.4. Consequently, rejoinder is respectfully requested.

Claim Objections

The Examiner has objected to claims 1, 86-96, and 98-107 as being drawn in the alternative to the subject matter of non-elected inventions. Applicant submits that this objection is overcome for the reasons stated above with respect to unity of invention.

Rejections Under 35 U.S.C. § 112, 2nd Paragraph

The Examiner has rejected claims 1, 86-96, and 98-107 under 35 U.S.C. § 112, 2nd paragraph, as allegedly being indefinite for reciting “the β integrin subunit is essentially not expressed by the cancer cells.” Specifically, the Examiner has taken the position that term “essentially” renders the claims indefinite.

Applicant respectfully disagrees with the Examiner's position. Nevertheless, without acquiescing to the rejection, and purely to expedite prosecution of the application, claim 1 has been amended to recite that “the β integrin subunit is not expressed on the outer cell membrane of cancer cells of the cancer...” Support for the classification of cancer cells as “non-expressing” with respect

to a β integrin subunit may be found through the specification and claims as originally filed, as well as within Example 3.1. Applicant respectfully requests that the rejection be withdrawn.

Rejections Under 35 U.S.C. § 112, 1st Paragraph

The Examiner has rejected claims 1, 86-96, and 98-107 under 35 U.S.C. § 112, 1st paragraph, as allegedly lacking written description. Specifically, the Examiner has alleged that the specification does not provide sufficient written description for the genus of either “facilitator moieties” or “polypeptides that bind to a binding domain of MAP kinase.” Applicant respectfully disagrees.

Applicant would like to respectfully invite the Examiner’s attention to the disclosure provided in the body of the specification at page 19, line 4 to page 20, line 6, which describes a range of possible moieties useful for facilitating passage of the polypeptide of the invention across the outer cell membrane of the cancer cells into the cytoplasm of the cells. For example, such moieties may include, but are not limited to, signal peptides (and fragments thereof), lipid moieties and fatty acids (e.g., C16-C20 fatty acids). In particular, page 19, lines 29-31 state that:

“The invention is not limited to the use of any such non-peptide facilitator molecule and any molecule which provides the desired cell membrane solubility that is physiologically acceptable may be used.”

Accordingly, the invention is not dependent on the particular type of facilitator moiety employed, and it is clear that Applicant contemplated the use of any suitable such moieties that might be useful, a range of which are exemplified in the specification. It is Applicant’s position that the use of such cell penetrating peptides was well known to one of ordinary skill in the art at the time of the invention, as evidenced by the references cited at page 19, lines 10-11 of the specification, most of which were published more than a decade prior to the filing date of the application. Applicant submits that the skilled artisan, having read the instant specification, could readily identify any of a number of known, and commercially available, facilitator moieties for use in the invention, and thereby construct and improve upon the instant invention for the benefit of the public: a central purpose of the written description requirement of 35 U.S.C. § 112, 1st paragraph. Consequently,

Applicant respectfully submits that the specification clearly demonstrates possession of the claimed genus of “facilitator moieties.”

With respect to “polypeptides that bind to a binding domain of MAP kinase,” the Examiner’s attention is further drawn to the disclosure at page 18, line 13 to page 19, line 3 setting out a consensus scheme for the binding domains of the $\beta 2$, $\beta 3$, $\beta 5$ and $\beta 6$ for ERK providing significant guidance for the amino acid changes/modifications that may be made to a given binding domain of a β integrin subunit for ERK2 in accordance with the invention. The Examiner will note that a consensus framework sequence is provided at page 18, lines 27-29. As claim 1 has been amended to recite that the modified amino acid sequence has “80% sequence identity with the binding domain or greater” and the β integrin subunit has been defined as being selected from the group consisting of $\beta 2$, $\beta 3$, $\beta 5$, and $\beta 6$, Applicant respectfully submits that the genus has been limited to a discrete, relatively small number of defined species. Upon reading the specification, one of skill in the art would know that Applicant was in possession of the claimed genus. Applicant respectfully requests that the rejection be withdrawn.

Rejections Under 35 U.S.C. § 102(a)

The Examiner has rejected claims 1, 86-94, and 98-107 under 35 U.S.C. § 102(b) as being anticipated by Agrez (WO2001/000677). Applicants respectfully traverse.

Applicant respectfully disagrees with the Examiner’s position that Agrez anticipates the invention. However, in order to expedite prosecution, and not in acquiescence to the Examiner’s rejection, Applicant has amended claim 1 to clarify and more clearly define the invention. Specifically, claim 1 has been amended to clarify that the polypeptide provides a binding domain of a β integrin subunit for the MAP kinase ERK2 (or a modified form of the polypeptide) for the prophylaxis or treatment of cancer wherein the β integrin subunit is not expressed by the cancer cells. Furthermore, the β integrin subunit is selected from the group consisting of $\beta 2$, $\beta 3$, $\beta 5$ and $\beta 6$, which are all members of the same class of integrin subunits with a binding domain for ERK2 that has an intervening linker region joining opposite end regions of the binding domain together that is non-essential for the binding if ERK2 (and so can be deleted).

Applicant respectfully submits that Agrez does not teach that the β integrin is “not expressed on the outer cell membrane of cancer cells of the cancer.” The Examiner has stated that Agrez teaches that 50% of bowel cancer tumors express β integrin, and has used this statement to suggest that the polypeptide of Agrez also encompasses cells where β integrin is not expressed. However, Applicant believes the Examiner has misstated the teachings of Agrez in this regard. Agrez actually teaches on page 37 that β integrin is expressed “in at least 50% of bowel cancer tumours.” In view of this teaching, Applicant respectfully submits that Agrez does not teach the β integrin is “not expressed on the outer cell membrane of cancer cells of the cancer” as presently claimed. Additionally, Agrez does not teach a “linker region” that links the opposite end regions of the binding domain together as presently claimed. For at least the foregoing reasons, Applicant respectfully submits that Agrez does not anticipate the instant rejections. Withdrawal of the rejection and favorable reconsideration is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

Claims 1 and 93-96 are rejected under 35 U.S.C. § 103(a) as obvious over Agrez in view of Nadler et al. (US 5,877,282). Applicant respectfully traverses.

As described above, Agrez does not anticipate the invention as currently claimed. Applicant respectfully submits that Nadler *et al.* does not overcome any the deficiencies of Agrez as stated above. Therefore, neither Agrez nor Nadler *et al.*, alone or in combination, teach or suggest the invention as currently claimed. Applicant respectfully requests that this rejection be withdrawn.

Claim Rejections – Judicially Created Doctrine of Double Patenting

The Examiner has rejected claims 1, 86-96, and 98-107 under the judicially created doctrine of double patenting as being unpatentable over claims 217-219, 225, 238, and 277 of co-pending U.S. Patent Application No. 10/019,816. Applicant will address the obviousness-type double patenting rejection upon a finding that the pending claims are in condition for allowance, but for the double patenting rejection.

CONCLUSION

In view of the above remarks, Applicants believe the pending application is in condition for allowance. Accordingly, the Office is respectfully requested to pass this application to issue. Should any of the claims not be found to be allowable, Applicants respectfully request the Office to telephone Applicants' undersigned representative at the number below so that a telephonic interview may be scheduled. Applicants thank the Office in advance for this courtesy.

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Respectfully submitted,

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